CHECKLIST ENVIRONMENTAL ASSESSMENT

Project Name:	Arrowhead 3D
Proposed Implementation Date:	October 2018
Proponent:	Petro-Hunt, LLC
Location:	Surface and Minerals- T16N-R54E-Sec 10, 12, 16, 36 T17N-R53E-Sec 36 T17N-R54E-Sec 36 Minerals only - T15N-R54E-Sec 36 T16N-R55E-Sec 16
County:	Dawson

I. TYPE AND PURPOSE OF ACTION

Petro-Hunt, LLC (Henceforth referred to as the proponent) has requested to conduct a seismic survey on the State Trust land mentioned above. This project would utilize seismic detecting vibraphone equipment for the purpose of oil and gas exploration. This proposed survey is generalized and encompasses the Woodrow, Sand Creek, and Glendive oil fields north of Glendive.

II. PROJECT DEVELOPMENT

1. PUBLIC INVOLVEMENT, AGENCIES, GROUPS OR INDIVIDUALS CONTACTED:

Provide a brief chronology of the scoping and ongoing involvement for this project.

The proponent has submitted the proper documentation to request this project. The ELO and Minerals Management Bureau staff have conducted a field review on the project on July 18 & 19, 2018. The proponent has been in touch with the DNRC and the surface lessees to discuss potential impacts. The surface lessees shall negotiate actual damage to crop and grazing land. The state shall receive the license fee based on the number of miles of vibroseis conducted.

2. OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION, LIST OF PERMITS NEEDED:

Montana Fish, Wildlife, and Parks holds an easement for a gun range in 16N 54E S36 and will conduct their own assessment of site conditions with regard to safety, etc. and issue their own stipulations for work within their easement.

3. ALTERNATIVES CONSIDERED:

Alternative A- Allow the proponent to conduct the seismic survey of these parcels of State Trust Land
Alternative B- No Action

III. IMPACTS ON THE PHYSICAL ENVIRONMENT

- *RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.*
- *Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.*
- *Enter "NONE" If no impacts are identified or the resource is not present.*

4. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE:

Consider the presence of fragile, compactable or unstable soils. Identify unusual geologic features. Specify any special reclamation considerations. Identify any cumulative impacts to soils.

Alternative A- Soil composition is varied throughout the project, ranging from active badlands to developed loams. Soil types primarily include loams and silt loams, and range in depth from 4 to over 40 inches. Some soil disturbance may take place as a result of equipment traversing the landscape. Major disturbance can be mitigated through limiting equipment from travelling on areas where soils are excessively fragile or areas of

steep terrain. Equipment will not be allowed into any wetland, sub irrigated sites, or rivers, streams, springs, reservoirs, ponds, hardwood thickets ect. on the project.

Alternative B- No Impacts expected

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5. WATER QUALITY, QUANTITY AND DISTRIBUTION:

Identify important surface or groundwater resources. Consider the potential for violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality. Identify cumulative effects to water resources.

Alternative A- Water quality will be maintained by excluding access to any area where ground or surface water could potentially be disturbed. All equipment will be kept out of rivers, wetlands, sub irrigated ground or any area where water quality, quantity or distribution could be affected. A minimum 330-foot setback will be placed around all surface and subsurface water sources and impoundments.

Alternative B- No Impacts Expected

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6. AIR QUALITY:

What pollutants or particulate would be produced? Identify air quality regulations or zones (e.g. Class I air shed) the project would influence. Identify cumulative effects to air quality.

Alternative A- No significant impact expected.

Alternative B- No Impacts Expected

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7. VEGETATION COVER, QUANTITY AND QUALITY:

What changes would the action cause to vegetative communities? Consider rare plants or cover types that would be affected. Identify cumulative effects to vegetation.

Alternative A- Vegetation communities may be affected by this project. The use of equipment has the potential to damage some areas of the plant community. This may come from the vegetation being compacted by equipment and development of shot holes. Damage to the plant community should be lessened at this time of year since most species will be entering dormancy. There is no evidence of rare plants or cover types in the scope of the project. Current plant species which occupy the survey area include Western Wheatgrass (Agropyron Smithii), Green Needlegrass (Stipa Viridula), Blue Bunch Wheatgrass (Agropyron Spicatum), Prairie Sandreed (Calamovilfa longifolia), Little Bluestem (Schizachyrium scoparium Needle and Thread (Stipa comata), Prairie Junegrass (Koleria pyramidata), Blue Grama (Bouteloua gracilis), Sandberg Bluegrass (Poa secunda), Big Sagebrush (Artemisia tridentata), Silver Sagebrush (Artemisia cana), Fringed Sagewort (Artemisia frigida), Broom Snakeweed (Gutierrezia sarothrae), Downy Brome (Bromus tectorum) and Japanese Brome (Bromus japonicus). Range sites vary within the project, many of the range sites involved include Thin Hilly, Shallow with Gravel, Thin Breaks and Silty sites. The tracts also include dry land crop acreage. Any seismic survey will be done in a fashion not to interfere with crop production efforts.

Alternative B- No Impacts expected

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8. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS:

Consider substantial habitat values and use of the area by wildlife, birds or fish. Identify cumulative effects to fish and wildlife.

Alternative A-There may be minimal disruption to the wildlife that inhabit the area. The scale and length of the project should not be enough to permanently disrupt the wildlife species. Species in the area include Whitetail and Mule Deer, Antelope, Raptors and other birds, various rodents, rabbits, reptiles and others.

Alternative B- No Impacts Expected

9. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES:
Consider any federally listed threatened or endangered species or habitat identified in the project area. Determine effects to wetlands. Consider Sensitive Species or Species of special concern. Identify cumulative effects to these species and their habitat.

Alternative A- A search of the Montana Natural Heritage Database shows that no species of concern were noted on any state lands within the general project area.
Alternative B- No Impacts Expected

10. HISTORICAL AND ARCHAEOLOGICAL SITES:
Identify and determine effects to historical, archaeological or paleontological resources.

Alternative A- The seismic lines were inventoried to Class III standards for cultural and paleontological resources. Although a few cultural resources (lithic scatters and a historic homestead) were identified on state land, the seismic line routes have been modified to avoid these resources. As such, proposed seismic activities will have No Effect to Antiquities as defined under the Montana State Antiquities Act. A formal report of findings has been prepared and is on file with the DNRC and the Montana State Historic Preservation Officer.

Alternative B- No Impacts Expected

11. AESTHETICS:
Determine if the project is located on a prominent topographic feature, or may be visible from populated or scenic areas. What level of noise, light or visual change would be produced? Identify cumulative effects to aesthetics.

Alternative A- Very little impact should be felt aesthetically in the scope of this project. There should be minimal lasting affects on the landscape from this project. The project should only last a few days per tract and the landscape will be allowed to recover.

Alternative B- No Impacts Expected

12. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY:
Determine the amount of limited resources the project would require. Identify other activities nearby that the project would affect. Identify cumulative effects to environmental resources.

Alternative A- No impacts expected.

Alternative B- No Impacts expected

13. OTHER ENVIRONMENTAL DOCUMENTS PERTINENT TO THE AREA:
List other studies, plans or projects on this tract. Determine cumulative impacts likely to occur as a result of current private, state or federal actions in the analysis area, and from future proposed state actions in the analysis area that are under MEPA review (scoped) or permitting review by any state agency.

None

IV. IMPACTS ON THE HUMAN POPULATION

- *RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.*
- *Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.*
- *Enter "NONE" If no impacts are identified or the resource is not present.*

14. HUMAN HEALTH AND SAFETY:
Identify any health and safety risks posed by the project.

Alternative A- There may be potential safety risks for laborers but the potential risk should be minimal with proper safety efforts.

Alternative B- No Impact Expected

15. INDUSTRIAL, COMMERCIAL AND AGRICULTURE ACTIVITIES AND PRODUCTION:
Identify how the project would add to or alter these activities.

Alternative A- It has potential to have a positive effect on Industrial, Commercial and Agricultural Activities and Production.

Alternative B- No Impacts Expected

16. QUANTITY AND DISTRIBUTION OF EMPLOYMENT:
Estimate the number of jobs the project would create, move or eliminate. Identify cumulative effects to the employment market.

Alternative A- This project has the potential to create jobs with further development possibilities.

Alternative B- No Impacts Expected

17. LOCAL AND STATE TAX BASE AND TAX REVENUES:
Estimate tax revenue the project would create or eliminate. Identify cumulative effects to taxes and revenue.

Alternative A- No Impacts Expected

Alternative B- No Impact

18. DEMAND FOR GOVERNMENT SERVICES:
Estimate increases in traffic and changes to traffic patterns. What changes would be needed to fire protection, police, schools, etc.? Identify cumulative effects of this and other projects on government services

Alternative A- No Impacts Expected

Alternative B- No Impact

19. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS:
List State, County, City, USFS, BLM, Tribal, and other zoning or management plans, and identify how they would affect this project.

Alternative A- No Impact Expected

Alternative B- No Impact

20. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES:
Identify any wilderness or recreational areas nearby or access routes through this tract. Determine the effects of the project on recreational potential within the tract. Identify cumulative effects to recreational and wilderness activities.

Alternative A- No Impacts Expected
Alternative B- No Impact

21. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING:
Estimate population changes and additional housing the project would require. Identify cumulative effects to population and housing.

Alternative A- No Impacts Expected

Alternative B- No Impact

22. SOCIAL STRUCTURES AND MORES:
Identify potential disruption of native or traditional lifestyles or communities.

Alternative A- No Impacts Expected

Alternative B- No Impact

23. CULTURAL UNIQUENESS AND DIVERSITY:
How would the action affect any unique quality of the area?

Alternative A- No Impacts Expected

Alternative B- No Impact

24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:
Estimate the return to the trust. Include appropriate economic analysis. Identify potential future uses for the analysis area other than existing management. Identify cumulative economic and social effects likely to occur as a result of the proposed action.

Alternative A- This project will provide the trust with a license payment based on the number of charges and on the mileage of vibroseis lines. The amount of which has yet to be calculated.
Alternative B- No Impact

EA Checklist Prepared By:	**Name:**	Bryan Allison	**Date:**	October 2018
	Title:	Mineral Resource Specialist		

V. FINDING

25. ALTERNATIVE SELECTED:

Alternative A

26. SIGNIFICANCE OF POTENTIAL IMPACTS:

The granting of the requested seismic survey permit upon these tracts of state-owned trust lands for the proposed Seismic Survey Project should not result in nor cause significant negative environmental impacts. The predicted impacts will be adequately mitigated through the seismic permit rules and site-specific stipulations. The proposed action satisfies the trusts fiduciary mandate and ensures the long-term productivity of the land. An environmental assessment checklist is the appropriate level of analysis for the proposed action.

27. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS:

[ ]	EIS	[ ]	More Detailed EA	[X]	No Further Analysis

EA Checklist Approved By:	**Name:**	Trevor Taylor
	Title:	Petroleum Engineer, Minerals Management Bureau
Signature:	Trevor E Taylor	**Date:** 10/12/18